

## CLAIMS

What is claimed is:

1. A method of specifying a trace array for a simulation in a data processing system, said method comprising:
  - specifying one or entities within a simulation model with one or more statements in one or more hardware description language (HDL) files;
  - in one or more statements in the one or more HDL files, specifying a trace array for storing trace data that will be generated through simulation of the simulation model; and
  - storing said one or more HDL files.
2. The method of Claim 1, wherein said specifying a trace array comprises specifying a set of signals for which values are to be presented within the trace array.
3. The method of Claim 2, wherein specifying a trace array comprises specifying an association between an enumerated value and a set of values of said signals.
4. The method of Claim 1, wherein said specifying said trace array comprises specifying said trace array in one or more statements within an HDL file declaring an instrumentation entity containing the trace array.
5. The method of Claim 1, wherein said specifying said trace array comprises specifying said trace array comprises specifying said trace array within an HDL file declaring a design entity.

6. A method of preparing a simulation model of a digital design within a data processing system, said method comprising:

receiving one or more hardware description language (HDL) files declaring a plurality of entities forming the digital design, wherein said one or more HDL files include one or more statements specifying a trace array for storing trace data generated through simulation of the simulation model; and

in response to receipt of the one or more HDL files, parsing and processing said one or more HDL files to generate a simulation model formed of representations of the plurality of the design entities and a trace array within at least one of the plurality of design entities.

7. The method of Claim 6, wherein said parsing and processing said one or more HDL files includes creating, within the trace array, storage for values of a set of signals.

8. The method of Claim 7, wherein said parsing and processing said one or more HDL files includes creating an association between an enumerated value and a set of values of said signals.

9. The method of Claim 6, wherein said receiving one or more HDL files comprises receiving an HDL file including one or more statements declaring an instrumentation entity containing the trace array.

10. The method of Claim 6, said receiving one or more HDL files comprises receiving an HDL file including one or more statements declaring a design entity containing the trace array.

11. The method of Claim 6, wherein said parsing and processing includes automatically replicating said trace array within a plurality of instances of an entity declared by an HDL file containing the one or more statements specifying the trace array.

12. A method of reporting simulation data obtained by the simulation of a digital design within a data processing system, said method comprising:

a simulator running a testcase against a simulation model formed of representations of the plurality of the design entities and a trace array within one of the plurality of design entities;

recording trace data within the trace array during said simulation; and

exporting said trace data from said trace array in a trace file and storing said trace file in data storage.

13. The method of Claim 12, wherein recording trace data includes recording, within the trace array, values assumed by a set of signals during simulation.

14. The method of Claim 13, wherein exporting the trace data in a trace file includes exporting the trace data in a trace file indicating an association between an enumerated value and a set of values of said signals.

15. The method of Claim 12, and further comprising instantiating the trace array within an instrumentation entity within the simulation model.

16. A data processing system, comprising:
  - means for specifying one or entities within a simulation model with one or more statements in one or more hardware description language (HDL) files;
  - means for specifying, in one or more statements in the one or more HDL files, a trace array for storing data generated through simulation of the simulation model; and
  - means for storing said one or more HDL files.
17. The data processing system of Claim 16, wherein said means for specifying a trace array comprises means for specifying a set of signals for which values are to be presented within the trace array.
18. The data processing system of Claim 16, wherein said means for specifying a trace array comprises means for specifying an association between an enumerated value and a set of values of said signals.
19. The data processing system of Claim 16, wherein said means for specifying said trace array comprises means for specifying said trace array in one or more statements within an HDL file declaring an instrumentation entity containing the trace array.
20. The data processing system of Claim 16, wherein said means for specifying said trace array comprises means for specifying said trace array within an HDL file declaring a design entity.
21. A data processing system for preparing a simulation model of a digital design, said data processing system comprising:

means for receiving one or more hardware description language (HDL) files declaring a plurality of entities forming the digital design, wherein said one or more HDL files include one or more statements specifying a trace array for storing trace data generated through simulation of the simulation model; and

means, responsive to receipt of the one or more HDL files, for parsing and processing said one or more HDL files to generate a simulation model formed of representations of the plurality of the design entities and a trace array within at least one of the plurality of design entities.

22. The data processing system of Claim 21, wherein said means for parsing and processing said one or more HDL files includes means for creating, within the trace array, storage for values of a set of signals.

23. The data processing system of Claim 22, wherein said means for parsing and processing said one or more HDL files includes means for creating an association between an enumerated value and a set of values of said signals.

24. The data processing system of Claim 21, wherein said means for receiving one or more HDL files comprises means for receiving an HDL file including one or more statements declaring an instrumentation entity containing the trace array.

25. The data processing system of Claim 21, said means for receiving one or more HDL files comprises means for receiving an HDL file including one or more statements declaring a design entity containing the trace array.

26. The data processing system of Claim 21, wherein said means for parsing and processing includes means for automatically replicating said trace array within a plurality of instances of an entity declared by an HDL file containing the one or more statements specifying the trace array.

27. A data processing system, said data processing system comprising:  
means for running a testcase against a simulation model formed of representations of the plurality of the design entities and a trace array within one of the plurality of design entities;  
means for recording trace data within the trace array during said simulation; and  
means for exporting said trace data from said trace array in a trace file and storing said trace file in data storage.

28. The data processing system of Claim 27, wherein means for recording trace data includes means for recording, within the trace array, values assumed by a set of signals during simulation.

29. The data processing system of Claim 27, wherein said means for exporting the trace data in a trace file includes means for exporting the trace data in a trace file indicating an association between an enumerated value and a set of values of said signals.

30. The data processing system of Claim 27, and further comprising means for instantiating the trace array within an instrumentation entity within the simulation model.

31. A program product, comprising a computer usable medium, including:  
means for specifying one or entities within a simulation model with one or more statements in one or more hardware description language (HDL) files;  
means for specifying, in one or more statements in the one or more HDL files, a trace array for storing data generated through simulation of the simulation model; and  
means for storing said one or more HDL files.
32. The program product of Claim 31, wherein said means for specifying a trace array comprises means for specifying a set of signals for which values are to be presented within the trace array.
33. The program product of Claim 31, wherein said means for specifying a trace array comprises means for specifying an association between an enumerated value and a set of values of said signals.
34. The program product of Claim 31, wherein said means for specifying said trace array comprises means for specifying said trace array in one or more statements within an HDL file declaring an instrumentation entity containing the trace array.
35. The program product of Claim 31, wherein said means for specifying said trace array comprises means for specifying said trace array within an HDL file declaring a design entity.
36. A program product for preparing a simulation model of a digital design, said program product comprising a computer usable medium, including:

means for receiving one or more hardware description language (HDL) files declaring a plurality of entities forming the digital design, wherein said one or more HDL files include one or more statements specifying a trace array for storing trace data generated through simulation of the simulation model; and

means, responsive to receipt of the one or more HDL files, for parsing and processing said one or more HDL files to generate a simulation model formed of representations of the plurality of the design entities and a trace array within at least one of the plurality of design entities.

37. The program product of Claim 36, wherein said means for parsing and processing said one or more HDL files includes means for creating, within the trace array, storage for values of a set of signals.

38. The program product of Claim 37, wherein said means for parsing and processing said one or more HDL files includes means for creating an association between an enumerated value and a set of values of said signals.

39. The program product of Claim 36, wherein said means for receiving one or more HDL files comprises means for receiving an HDL file including one or more statements declaring an instrumentation entity containing the trace array.

40. The program product of Claim 36, said means for receiving one or more HDL files comprises means for receiving an HDL file including one or more statements declaring a design entity containing the trace array.



41. The program product of Claim 36, wherein said means for parsing and processing includes means for automatically replicating said trace array within a plurality of instances of an entity declared by an HDL file containing the one or more statements specifying the trace array.

42. A program product comprising a computer usable medium, including:  
means for running a testcase against a simulation model formed of representations of the plurality of the design entities and a trace array within one of the plurality of design entities;  
means for recording trace data within the trace array during said simulation; and  
means for exporting said trace data from said trace array in a trace file and storing said trace file in data storage.

43. The program product of Claim 42, wherein means for recording trace data includes means for recording, within the trace array, values assumed by a set of signals during simulation.

44. The program product of Claim 42, wherein said means for exporting the trace data in a trace file includes means for exporting the trace data in a trace file indicating an association between an enumerated value and a set of values of said signals.

45. The program product of Claim 42, and further comprising means for instantiating the trace array within an instrumentation entity within the simulation model.